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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/814,311	03/21/2001	Jae-Yoel Kim	678-638 (P9799)	4839

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EXAMINER	
BRITT, CYNTHIA H	
ART UNIT	**PAPER NUMBER**
2133	

DATE MAILED: 05/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/814,311	KIM ET AL.	
	Examiner	Art Unit	
	Cynthia Britt	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-18 are presented for examination.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.1 14, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.1 14, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.1 14. Applicant's submission filed on 03/03/2004 has been entered.

Response to Arguments

Applicant's arguments filed March 10,2005 have been fully considered but they are not persuasive.

Applicant states "However, it is respectfully submitted that the AAPA in combination with Molnar and Sarkar does not teach the mathematical expression of the claims of the present application. That is, the AAPA may teach encoding by repeating, Molnar may teach puncturing, and Sarkar may teach repeating and puncturing, but *none of these references, either alone or in combination, teach performing these steps as recited by the mathematical equations of Claims 1, 4, and 7.*" (emphasis added)

An apparatus must be distinguished from the prior art in terms of structure rather than function (MPEP 2114), and the method provides a means, which must also impart

some structural change or difference in a device in order to carry out a method.

(emphasis added) In the instant application, the recited equation imparts no structural change by use of the method. The number of repetitions, *t* is a fixed value as is the length of the code symbol sequence, *N* for the method at any point in time and there is no indication that these change after an initial selection. See, e.g., In re Schreiber, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997) and In re Swinehart, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971).

Also, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (A.PA) in view of Molnar et a1., U.S. 5,691,922, and Sarkar et a1., U.S. 6,671,851.

As per claim 1, applicant discloses that it is known in the art to utilize an (8,3) encoding system, however fails to teach to puncturing unnecessary bits of said code to realize a (r,k) simplex code wherein ($r = 2^k - 1$) (Fig. 1). Molnar teaches to an encoding method that encodes input information and then punctures unnecessary symbols (Fig.4b,4c). It would have been obvious for one of ordinary skill in the art to utilize the

encoding method of Molnar in conjunction with the encoding system in figure 1 of the APA because the introduction of a puncturing circuit in the encoder allows for unnecessary bits in the (8,3) codeword to be punctured, thus allowing more data to be sent over an equal sized channel. However, this combination that does include the repetition of the code symbols (APA: pg.4: 16), fails to address the problem that punctured codes may exceed the original code length N. Sarkar teaches to a puncturing system that punctures code symbols after repetition for the case when the number of code symbols does not match the data frame (Fig.8; Col.9: 37-49). It would have been obvious for one of ordinary skill in the art to make use of the puncturing method disclosed by Sarkar in view of the aforementioned combination of the APA and Molnar because Sarkar allows for a technique of rate matching that would allow for standardized data frames to be transmitted by the system of the APA and Molnar, while still allowing for the maximized bandwidth usage disclosed above. The examiner would also like to point out that puncturing position is a repeated function of the puncture/repetition pattern and it would necessarily be a design choice based upon the designer's objectives as to where and how often to puncture. For any given transmission the number of bits and the codeword length do not change and repeating the sequence of code symbols as many times as necessary in order to rate match.

As per claim 2, Sarkar teaches to uniform distribution of the punctured symbols across the repeated code symbols according to a predetermined pattern (Col. 10: 15-19).

As per claim 3, Sarkar teaches to puncturing symbols in a specified frame (Col. 10: 15-19).

As per claim 4, which is the corresponding apparatus claim to rejected claim 1. As such, analogous reasoning to that used above in the rejection of claim 1 is further applied in the rejection of claim 4.

As per claim 5, which is the corresponding apparatus claim to rejected claim 2. As such, analogous reasoning to that used above in the rejection of claim 2 is further applied in the rejection of claim 5.

As per claim 6, which is the corresponding apparatus claim to rejected claim 3, and as such, analogous reasoning to that used above in the rejection of claim 3 is further applied in the rejection of claim 6.

As per claim 7, Applicant discloses that it is known in the art to utilize an (8,3) encoding system, however fails to teach to puncturing unnecessary bits of said code to realize a (7,3) simplex code. Molnar teaches to an encoding method that encodes input information and then punctures unnecessary symbols (Fig.4b, 4c). It would have been obvious for one of ordinary skill in the art to utilize the encoding method of Molnar in conjunction with the encoding system in figure 1 of the APA because the introduction of a puncturing circuit in the encoder allows for unnecessary bits in the (8,3) codeword to be punctured, thus allowing more data to be sent over an equal sized channel. However, this combination that does include the repetition of the code symbols (APA: pg.4: 16), fails to address the problem that punctured codes may exceed the original code length N. Sarkar teaches to a puncturing system that punctures code symbols

after repetition for the case when the number of code symbols does not match the data frame (Fig.8; Col.9: 37-49). It would have been obvious for one of ordinary skill in the art to make use of the puncturing method disclosed by Sarkar in view of the aforementioned combination of the APA and Molnar because Sarkar allows for a technique of rate matching that would allow for standardized data frames to be transmitted by the system of the APA and Molnar, while still allowing for the maximized bandwidth usage disclosed above. The examiner would also like to point out that puncturing position is a repeated function of the puncture/repetition pattern and it would necessarily be a design choice based upon the designer's objectives as to where and how often to puncture.

As per claim 8, Sarkar teaches to puncturing bits in a data sequence for the case when the number of code symbols does not match the data frame (Col. 10: 15-19). Therefore, for the case where there total repeated codes divided by the encoded information equals one, the system of Sarkar punctures the amount of bits to make the total number of code symbols fit the capacity of the frame, in this case 6 bits.

As per claim 9, Sarkar teaches to puncturing bits in a data sequence for the case when the number of code symbols does not match the data frame (Col. 10:15-19). Therefore, for the case where there total repeated codes divided by the encoded information equals two, the system of Sarkar punctures the amount of bits to make the total number of code symbols fit the capacity of the frame, in this case 5 bits.

As per claim 10, Sarkar teaches to puncturing bits in a data sequence for the case when the number of code symbols does not match the data frame (Col. 10: 15-19).

Therefore, for the case where there total repeated codes divided by the encoded information equals three, the system of Sarkar punctures the amount of bits to make the total number of code symbols fit the capacity of the frame, in this case 4 bits. Moreover, the methods of Sarkar include puncturing specific symbols in a specified frame (Col. 10: 15-19).

As per claim 11, Sarkar teaches to puncturing bits in a data sequence for the case when the number of code symbols does not match the data frame (Col. 10: 15-19). Therefore, for the case where there total repeated codes divided by the encoded information equals four, the system of Sarkar punctures the amount of bits to make the total number of code symbols fit the capacity of the frame, in this case 3 bits. Moreover, the methods of Sarkar include puncturing specific symbols in a specified frame (Col. 10: 15-19).

As per claim 12, Sarkar teaches to puncturing bits in a data sequence for the case when the number of code symbols does not match the data frame (Col. 10:15-19). Therefore, for the case where there total repeated codes divided by the encoded information equals five, the system of Sarkar punctures the amount of bits to make the total number of code symbols fit the capacity of the frame, in this case 2 bits.

As per claim 13, Sarkar teaches to puncturing bits in a data sequence for the case when the number of code symbols does not match the data frame (Col. 10: 15-19). Therefore, for the case where there total repeated codes divided by the encoded information equals six, the system of Sarkar punctures the amount of bits to make the total number of code symbols fit the capacity of the frame, in this case 1 bit.

As per claim 14, Sarkar teaches to puncturing bits in a data sequence for the case when the number of code symbols does not match the data frame (Col. 10: 15-19). Therefore, for the case where there total repeated codes divided by the encoded information equals three, the system of Sarkar punctures the amount of bits to make the total number of code symbols fit the capacity of the frame, in this case 4 bits. Moreover, the methods of Sarkar include puncturing specific symbols of repeated code symbols (Col. 10: 15-19).

As per claim 15, Sarkar teaches to puncturing bits in a data sequence for the case when the number of code symbols does not match the data frame (Col. 10: 15-19). Therefore, for the case where there total repeated codes divided by the encoded information equals four, the system of Sarkar punctures the amount of bits to make the total number of code symbols fit the capacity of the frame, in this case 3 bits. Moreover, the methods of Sarkar include puncturing specific symbols of repeated code symbols (Col. 10: 15-19).

As per claim 16, the encoding of the k-bit sequence of data in the system of Sarkar indicates the data rate of a mobile station (Fig. 1-4, 8; Col.8: 61 - Col.9: 17).

As per claim 17, the encoding of the k-bit sequence of data in the system of Sarkar indicates the data rate of a mobile station (Fig. 1-4, 8; Col.8: 61 - Col.9: 17).

As per claim 18, the encoding of the k-bit sequence of data in the system of Sarkar indicates the data rate of a mobile station (Fig. 1-4, 8; Col.8: 61 - Col.9: 17).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Publication 2002/0003813 Marko, Paul D.

This application teaches the source bit stream is encoded using a convolutional encoder in accordance with the present invention. The convolutional encoder is a convolutional encoder with a constraint length of 7. Thus, for every input bit from the source data stream, a 3-bit symbol is generated, as indicated by the encoder output. A data group is generated by the convolutional encoder. Each data group generated by the convolutional encoder is subjected to 1 in 9 puncturing. A punctured data group is depicted in FIG. 4A. The bit positions of the data group are numbered 1 through 9 for illustrative purposes. The fifth bit position is preferably punctured. The remaining eight bit positions are divided between two transmission channels

U.S. Patent No. 6,732,316 Tong et al.

This patent teaches a channel interleaver for a communications system including a data rate matching circuit, which performs puncturing of data symbols,

U.S. Patent No. 6,604,216 Javerbring et al.

This patent teaches a wireless communications system and method capable of supporting an incremental redundancy error-handling scheme using available gross rate channels.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Britt whose telephone number is 571-272-3815. The examiner can normally be reached on Monday - Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on 571-272-3819. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Cynthia Britt
Examiner
Art Unit 2133

GUY LAMARRE
PRIMARY EXAMINER